

**CLAIMS**

1. A sensor for the detection of an analyte, which comprises a holographic element comprising a medium and a hologram disposed throughout the volume of the medium, wherein an optical characteristic of the hologram changes as a result of a variation of a physical property occurring throughout the volume of the medium, wherein the medium is obtainable by formation *in situ* in the presence of a pore-forming agent, wherein the agent is not present in the sensor or does not react with the analyte and the sensor.
- 5 2. A sensor according to claim 1, wherein the physical property is the size of the medium.
- 10 3. A sensor according to claim 1 or claim 2, wherein the optical characteristic is the reflectance, refractance or absorbance of the holographic element.
4. A sensor according to any preceding claim, wherein the agent is a gas.
5. A sensor according to any of claims 1 to 3, wherein the agent is a liquid.
- 15 6. A sensor according to any preceding claim, wherein the agent is water.
7. A sensor according to any of claims 1 to 3, wherein the agent is a solid obtainable by extraction of the agent after the formation.
8. A sensor according to any preceding claim, wherein the medium is a polymer obtainable by the polymerisation of monomers *in situ*.
- 20 9. A sensor according to claim 8, wherein the monomers include hydroxyethyl methacrylate.